SECRET

4 April 1957

MEMORANDUM FOR THE RECORD

SUBJECT: Discussion of Using a Steam Engine as the Power Source for the Portable Trench Digger

1. It has been suggested that a possible solution to the noise problem associated with the digger would be to use a steam engine for the power source. This would require a steam generator, either integral or remote from the engine, and a source of water. A steam propulsion unit designed to silently power a reconnaissance boat has been designed for the [redacted]. The requirements and specifications required by the [redacted] are similar to those for the portable trench digger and thus give a good indication of the feasibility of using steam power. The ERDL unit has an output of 7.5 hp, weighs 149 lbs. dry, has a steam consumption of 180 lbs/hour, and cannot be heard more than 100 feet away when operating in water. The steam generator is connected to the engine by flexible tubing and operates on 60 octane gasoline. 25X1 25X1

2. The following factors in considering the feasibility of using steam are based primarily on the ERDL unit because it is felt that further reduction in size, weight, noise, etc. could not be practically obtained.

A. The 149 lbs. quoted as the weight of the [redacted] unit does not include the weight of water and gasoline, and it is felt that the total weight and size would be too much for desired maneuverability and portability. 25X1

B. The [redacted] unit is a closed system which means that the steam after it has passed through the engine is condensed and fed back to the generator. This system requires considerable cooling water for the condenser. If an open system were used, the steam would not be recovered after passing through the engine and a large supply of water would be required to give sufficient operating time. While either of these systems would be practical for a boat, it is felt that the quantity of water needed would prove impractical for the digger. 25X1

C. Although a steam engine operating under water, as the [redacted] unit does, would be fairly quiet, on the digger it would have to operate in the open. The noise associated with the digging chain would still be present and probably is a lower limit to the degree of silencing possible. 25X1

[redacted] 25X1

3. The general conclusion is that steam would not be a satisfactory or practical means of supplying power for the portable trench digger. An approach to silent operation presently considered more encouraging is an electric motor which is currently being investigated.

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